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Notes on Carex—VI.

BY L. H. BAILEY, JR.

1. The half-dozen most critical and trying groups of Carices, within the Manual region, may be named as follows: (1) The scoparia group, including CC. scoparia, lagopodioides, cristata and var. mirabilis; (2) C. laxiflora and its varieties, with CC. oligocarpa and digitalis; (3) CC. stricta, aperta and vulgaris; (4) C. straminea and its varieties; (5) C. Pennsylvanica and its immediate allies, CC. varia, Emmonsii and Novæ-Angliæ, and even C. umbellata; (6) CC. aristata, trichocarpa, and the var. imberbis.

2. C. Pennsylvanica and C. varia are apparently distinct. I should define and contrast them as follows:

C. PENNSYLVANICA Lam. *Stoloniferous*, forming large patches: *leaves usually as long as the mostly slender culms* (which are commonly less than ten inches high), *narrow, soft and grass-like: spikes one to three, approximate, usually contiguous* (the two lowest very rarely more than a half inch apart), *globose, all closely sessile, commonly more or less dark colored.*

C. VARIA Muhl. *Not stoloniferous: stouter: leaves broader* ($1\frac{1}{2}$ lines to 2 lines), *usually shorter than the more or less prolonged culms* (which are from ten inches to two feet high), *rather rigid: spikes three to five, globose or oblong, scattered* (from $\frac{1}{2}$ inch to $1\frac{1}{2}$ inches apart), *mostly light colored, the lowest often peduncled and commonly subtended by a conspicuous bract.* The very large forms with oblong and peduncled spikes and leafy bracts are taken as the type by Dr. Boott, and the more ordinary forms are referred to var. minor. It appears hardly worth while, however, to make such a division.

3. C. Bebbii Olney I referred to C. lagopodioides in my preliminary Carex Catalog. I have sharp notes from correspondents

who would refer it to C. scoparia. My specimens, from Olney, are large and decidedly like C. lagopodioides, especially in the character of the sheaths. I have seen other specimens which appear to be nearer C. scoparia. It appears to lean strongest towards C. lagopodioides in general habit However, it is immaterial to which species it goes. Enough that it goes. Von Boeckeler makes short work with these species by making C. scoparia a variety of C. lagopodioides.

4. C. lagopodioides Schk. is often slender and very loose-headed northward. These forms are exceedingly puzzling, and they are distributed under a great variety of names. They approach C. cristata var. mirabilis. Olney proposed a varietal name to cover most of these forms, but never defined it. It is an important variety and I subjoin its character:

Var. MONILIFORMIS Olney Exsicc. *Culm slender, especially above, where it surpasses the long-pointed lax leaves: spikes two to ten, small, nearly globular* (usually less than $\frac{1}{4}$ in. in diameter), *all distinct, the lowest separated, bright straw or rust colored, the points of the spreading perigynia conspicuous.*—Cambridge, Mass., to New Brunswick and Vermont. A very similar form comes from Louisiana. The extreme forms bear little resemblance to the ordinary C. lagopodioides, but they always preserve the loose sheaths and other characters of the species.

5. C. fulva Good., and C. lævigata Smith, have never been found in the United States, so far as I know, since B. D. Greene collected them at Tewksbury, Mass. They were probably chance introductions and should be dropped. C. fulva occurs in Newfoundland, however. In fact, the original specimens were collected there. C. extensa Good., credited to Long Island in the Manual, also occurs, or did occur in 1870, near Norfolk, Va. (*McMinn.*) The same collector also found there the European sand Carex, C. arenaria L. It is singular that so few Carices become naturalized. So far as I know but six European Carices are naturalized in this country: C. præcox Jacq., C. acutiformis Ehrh. (C. paludosa Good.), C. extensa Good., C. hirta L., C. glauca Scop. (in Canada), C. muricata L., and probably also C. panicea L., and C. leporina L

6. C. straminea is remarkable from the fact that all its varieties are connected with the type by a complete series of gradations. The individuals of these intermediate forms are also common. The extreme form of the species is var. alata (C. alata Torr.) The type of this variety has heavy, conical, greenish spikes which are peculiarly striking. The intermediate forms

are more common than the type, however. For a half way form Olney proposed the name var. pseudo-straminea. So also the peculiar var. silicea (C. fœnea var.? sabulonum of the Manual) with its nodding culm passes directly into the species. The type of the variety grows in loose sand on the sea beach. A little inland its culm is erect and the plant often counterfeits var. chlorostachys Bcklr. (C. fœnea Willd.). I am now growing plants of this variety here at Lansing to see what effect an inland habitat will have. I have found a very near approach to this variety on Lake Michigan. Var. chlorostachys holds its characters the best of all the forms of the species, although there is great difficulty in disposing of a quarter of the specimens one receives. Its strongest union is with var. alata. So far as I know, this variety does not get far away from the Atlantic and Gulf borders, unless it be in the upper Canadian provinces. C. fœnea var.? ferruginea of the Manual is midway between the type of C. straminea and the var. tenera Boott. I was misled by numerous specimens, which I supposed to be authentic, to refer var. tenera to the species in the Carex Catalog. The plant designated by Prof. Dewey as C. tenera is well worthy a varietal recognition, however. It is not the plant which is commonly taken to be var. tenera. I should designate the variety as follows: *Culms nodding at the top: spikes four or five, heavy, globular or broadly conical, all separated, bright tawny or rusty.* Commonly confounded with forms of C. scoparia. An important character of the representative stramineas is the stiff culm which surpasses the very long-pointed leaves. I am satisfied that much of C. cristata, var. mirabilis belongs with C. straminea, and the rest of it with C. cristata and C. lagopodioides. There are no characters in it which are not also in one or all of these three species. It needs either to include more forms or none at all. I am planting a caricetum in which to study the sedges as they grow.

7. Mr. H. N. Patterson has collected C. misandra R. Br. (C. fuliginosa Sternb. & Hppe.) in Colorado this summer. It appears to be new to the United States. It is distinguished from C. frigida All., its nearest ally, by its *ovate or club-shaped spikes, androgynous terminal spike, and slender peduncles which are exserted from loose, colored sheaths.* It was named from Arctic American specimens. The C. fuliginosa of Schkuhr is the same as the older C. frigida All. Sternberg and Hoppe misapplied Schkuhr's name to the plant now designated C. misandra, supposing that they had Schkuhr's species. C. fuliginosa of Stern-

berg and Hoppe is therefore the oldest name of C. misandra, although the plant was first recognized as distinct when Robert Brown named it C. misandra. Under the circumstances it appears that Brown's name should stand.

The Study of the Parasitic Fungi.[1]

BY T. J. BURRILL.

It needs no argument to show the practical value of the studies undertaken upon these minute—probably degraded—members of the vegetable world, for they subsist on living plants of the higher orders, upon which our domestic animals and ourselves depend for the means and materials of physical existence. It is not, indeed, usually known or suspected what proportion of our crops and useful vegetation is destroyed by the microscopic growths which live as parasites or saprophytes upon them; but when we come to understand that in very great measure the things called "blights," "mildews," "rusts," "smuts," "rots," "ferments," etc., are really due to the despoliations of these same microscopic but multitudinous forms of fungi, some appreciation can be gained by any one, even with a moment's thought, of the immense aggregate loss that occurs. Perhaps, in one sense, it is well that cultivators do not fully realize the number and variety of parasitic growths which await the development of their valuable plants, and which are liable so badly to injure the latter, and so seriously to affect the receipts for expended labor. Surely, in many cases, there would be sufficient ground for discouragement and hesitation to venture in opposition to such an array of dangerous enemies, against whose insidious and covert attacks fighting seems futile.

But knowledge of the existence of such things can not make that existence more hazardous, nor the results more distressing; while here, as in the other battles of life, to be forewarned is to be forearmed. Knowledge is power, and as much so in this case as in any other; if the latter is still wanting, it is only because the former has not been attained. Is it attainable? There are difficulties in the way. The objects are very minute; we can not see them by the unaided eye as individuals, we can not thus watch their modes of dissemination, germination, growth and development; we only see them, if at all, in the mass, and know of their

[1] From Bull. Ill. State Lab. Nat Hist., Volume II.